CLAIMS

1. Fluid bed granulation process of a predetermined substance comprising the steps of:

- forming, through a fluidification air flow of predetermined flow rate, a fluid bed of granules of said substance to be granulated, fed to it in form of seeds,

- feeding said fluid bed with a continuous flow of a growth substance,

characterized in that it comprises the steps of:

- inducing the formation of a circulatory movement, substantially vortex-shaped, of the said granules of the substance to be granulated in said fluid bed and through at least part of said fluidification air flow, and

- maintaining and regulating said circulatory movement through said part of the fluidification air flow.

2. Process according to claim 1, characterized in that said substantially vortex-shaped circulatory movement has substantially horizontal axis.

3. Granulation process according to claim 2, characterized in that said fluidification air flow is divided into a plurality of fractions having respective flow rates comprised between a minimum value flow rate, sufficient to support the fluid bed, fed at a first zone thereof and a maximum value flow rate, fed in another zone of the same bed, so as to induce and to maintain said circulatory movement, substantially vortex-shaped, with substantially horizontal axis, of the granules of said substance.

4. Granulation process according to claim 3, characterized in that the variation in fluidification air flow rates between said first zone where the flow rate is minimum and the zone spaced out from it where the flow rate is maximum, is of the steps type.

5. Granulation process according to claim 3, characterized in that the variation in fluidification air flow rates between said first zone where the flow rate is minimum and the zone where the flow rate is maximum is substantially gradual and continuous.

6. Granulation process according to claim 2, characterized in that said fluidification air flow is distributed from below into said fluid bed prevalently according to a direction inclined on said substantially horizontal axis of said circulatory vortex movement intended to be induced in the fluid bed itself.

7. Fluid bed granulation process of a predetermined substance, carried out in a substantially parallelepiped container (2), with rectangular section, through a fluidification air flow fed into said container (2), through a bottom wall (3) substantially forming a grid thereof, wherein at one end (6) of said container (2) a flow of seeds of said substance is continuously fed, whereas, at the opposite end (7) thereof, a flow of finished granulated product is continuously discharged, wherein in said fluid bed a continuous flow of a growth substance for granules is also fed, characterized in that, in said fluid bed and through at least a part of said fluidification air, a circulatory movement, substantially vortex-shaped (V), of the said granules is induced and

maintained, with substantially helical movement thereof between said opposite ends of said container.

8. Fluid bed granulation process of a predetermined substance, carried out in a substantially parallelepiped container (2), preferably with rectangular section, through a fluidification air flow fed into said container (2), through a bottom wall (3) substantially forming a grid thereof, wherein in correspondence of at least one same side wall (4, 5) of said container (2) a flow of seeds of said substance and a flow of a granule-growth substance are continuously fed, whereas at a plurality of slits (14) formed in said bottom wall (3), a flow of finished granulated product is continuously discharged, characterized in that, in said fluid bed and through at least a part of said fluidification air, a circulatory movement, substantially vortex-shaped (V), of the said granules is induced and maintained.

9. Fluid bed granulator comprising a substantially parallelepiped container (2), equipped with a perforated bottom (3) comprised between two opposite long side walls (4, 5) and opposite short side walls (6, 7), characterized in that said bottom (3) is equipped with holes (11) distributed in said bottom (3) with increasing density or pitch starting from a wall (4) of the container (2) towards an opposite wall (5) of the container itself.

10. Granulator according to claim 9, characterized in that said holes (11) all have the same diameter or opening area.

11. Granulator according to claim 10, characterized in that in said bottom or grid (3) parallel bands (3a, 3b, 3c), of predetermined width, are provided, in each of which the

respective holes (11) are regularly distributed according to a predetermined "pitch", different from band to band.

12. Fluid bed granulator comprising a substantially parallelepiped container (2), equipped with a perforated bottom (3) comprised between two opposite long side walls (4, 5) and opposite short side walls (6, 7), characterized in that said bottom (3) is equipped with holes (11) uniformly distributed in the bottom itself and having a different diameter or opening area, the diameter of each hole (11) gradually increasing as one approaches a side wall (5) of said container (2), on which a distributor-supplier (10) of granule-growth substance is preferably supported.

13. Fluid bed granulator comprising a substantially parallelepiped container (2), equipped with a perforated bottom (3) comprised between two opposite long side walls (4, 5) and opposite short side walls (6, 7), with a respective distributor-supplier (10, 10a, 10b) of growth substance, in correspondence of at least one of said side walls (4, 5), characterized in that said bottom (3) is equipped with holes (11) all equally inclined to the horizontal by a predetermined angle α preferably between 30° and 60°.

14. Fluid bed granulator comprising a substantially parallelepiped container (2), equipped with a perforated bottom (3) comprised between two opposite long side walls (4, 5) and opposite short side walls (6, 7), characterized in that said bottom (3) is equipped with holes (11) uniformly distributed in the bottom itself and having the same diameter or opening area, and it is equipped with deflectors (20) inclined towards the wall (5) of the

container (2) by a predetermined angle α to the horizontal preferably between 30° and 60°, arranged on said bottom (3) at the holes (11) and with a predetermined distance from the holes (11).

15. Fluid bed granulator comprising a perforated bottom (3) according to any one of claims 9 to 14, characterized in that it comprises a plurality of slits (14), of predetermined width, for the release of finished granules from the container (2), and means for feeding a flow (A) of air or another suitable classification gas into said fluid bed through said slits (14).

16. Substantially rectangular grid suitable for constituting the bottom (3) of a fluid bed granulator, characterized in that it is equipped with holes (11) distributed in said grid with increasing density or pitch starting from one side of said grid towards an opposite side of the same grid.

17. Grid according to claim 16, characterized in that in said grid parallel bands (3a, 3b, 3c) of predetermined width are provided, in each of which the respective holes (11) are regularly distributed according to a predetermined "pitch", different from band to band.

18. Substantially rectangular grid suitable for constituting the bottom (3) of a fluid bed granulator, characterized in that it is equipped with holes (11) uniformly distributed in the grid itself and having a different diameter or opening area, the diameter of each hole (11) gradually increasing as one approaches a side of said grid.

19. Substantially rectangular grid suitable for constituting the bottom (3) of a fluid bed granulator, characterized in that it is equipped with holes (11) all equally inclined to the horizontal by a predetermined angle α preferably between 30° and 60°.

20. Substantially rectangular grid suitable for constituting the bottom (3) of a fluid bed granulator, characterized in that it is equipped with holes (11) uniformly distributed in the grid itself and having the same diameter or opening area, and with deflectors (20) inclined to the horizontal by a predetermined angle α preferably between 30° and 60°, arranged on said grid (3) at the holes (11) and with a predetermined distance from the holes (11).